

Appln. No. 10/763,734
Amendment dated October 4, 2007
Reply to Office Action mailed June 4, 2007

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REMARKS

Reconsideration is respectfully requested.

Claims 1 through 5, 7 through 13, and 16 through 19, and 21 remain in this application. Claims 6, 14, 15, 20, and 22 have been cancelled. No claims have been withdrawn. Claims 23 through 26 have been added.

Paragraph 4 through 8 of the Office Action

Claims 1 through 7, 11, 13 through 16, 20 and 22 have been rejected under 35 U.S.C. §102(b) as being anticipated by Ebstyne.

Claims 8, 9 and 17 have been rejected under 35 U.S.C. Section 103(a) as being unpatentable over Ebstyne in view of Ebata.

Claims 10 and 18 have been rejected under 35 U.S.C. Section 103(a) as being unpatentable over Ebstyne in view of Wells.

Claims 12 and 19 have been rejected under 35 U.S.C. Section 103(a) as being unpatentable over Ebstyne in view of Watkins.

Claim 21 has been rejected under 35 U.S.C. Section 103(a) as being unpatentable over Oh in view of Ebata and further in view of Wells and Watkins.

Claim 1 has been amended to include the requirements of claim 6, and therefore claim 1 includes the requirement of "monitoring at least one of the grid computers for activity indicating that additional disk storage space has been added to the at least one grid computer". (Independent claim 21 includes a similar requirement.)

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With respect to claim 6, the rejection of the Office Action states that:

As per claims 6 and 7, Ebstyne teaches the claimed invention as described above and furthermore, Ebstyne teaches about monitoring at least one of the grid computers for activity indicating that additional disk storage space has been added to the at least one grid computer; and allocating disk storage space on the at least one grid computer after detecting activity indicating that additional storage space has been added to the at least one grid computer (e.g. see paragraph [0047], lines 10-11).

Looking to the Ebstyne patent application, and particularly paragraph [0047], there it states (all emphasis added):

[0047] The client tier 46 exists in all of the plurality of enterprise personal computers 32 that are going to be used to recapture the unused disk space and brokers unused disk space by intelligently managing blocks of data sent to and from the service tier 42. The client tier 46 serves several functions, such as reserving a configurable portion of available storage space and reacting dynamically to the changing local environment. As local disk-space is used by local applications, the client tier 46 will relinquish the reserved storage space. As local storage space becomes free, the client tier 46 gradually assumes more of the storage space. For example, if the service tier 42 needs to write a certain amount of data, the client tier 46 determines the best one of the plurality of enterprise personal computers 32 for this particular amount of data to be stored based on its usage requirements.

However, while the claim language requires monitoring whether "additional disk storage space has been *added* to the at least one grid computer", the Ebstyne patent application discusses the discovery of *free* storage space on the local computer, to which the Ebstyne system "assumes more of the storage space". Thus, rather than detecting that disk storage space has been added to the computer, the Ebstyne patent talks about a client monitoring usage of the *existing* storage space on the computer for space that may be *recaptured*. Clearly one of ordinary skill in the art recognizes that disk storage space added to a computer cannot be "recaptured", as it has been "added to the... computer". It is therefore submitted that one of ordinary skill in the art would not understand from paragraph [0047] that the Ebstyne system performed the step of claim 6.

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Further, new claim 24 requires "monitoring at least one of the grid computers for activity indicating that *a total of disk storage space* on the at least one grid computer has been increased". (Claim 21 includes a similar requirement.) It is also submitted that the Ebstyne patent application would not lead one of ordinary skill in the art to this requirement. Also, new claim 25 requires that "monitoring includes determining that a total disk storage space on the at least one grid computer has been increased by the addition of a disk drive to the at least one grid computer".

Further, claim 3 requires "reserving a portion of predetermined size of the total disk storage space on each of the at least two grid computers, said reserved portion of the disk drives *being reserved for local use on the respective grid computer* of the at least two grid computers. New claim 23 requires that "reserving a portion of predetermined size of the total disk storage space includes restricting the portion of predetermined size of the total disk storage space *from being included in the single combined virtual storage drive*" (emphasis added).

It is stated in the rejection of claim 3 in the Office Action that:

As per claim 3, Ebstyne teaches the claimed invention as described above and furthermore, Ebstyne teaches about reserving a portion of predetermined size of the total disk storage space (i.e. 15% of the PD's disk space) on each of the at least two grid computers (i.e. PCs on the network), the reserved portion of the disk drives being reserved for local use on the respective grid computer of the at least two grid computers (e.g. see paragraph [0031]).

Looking to the Ebstyne patent application at paragraphs [0030] and [0031], it states:

[0030] As a practical example, the above major enterprise has an amazing theoretical capacity of more than 1.5 petabytes (1,500 terabytes) in unused workstation disk space accessible by the present invention. By comparison, the major enterprise would normally require 75 terabytes of data for its normal operations and no more than 150 terabytes for expansion.

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[0031] Assuming that the present invention always leaves 15% of a PC's disk space free, and that data will be stored redundantly across a minimum of four PC's: that still means an additional 330 terabytes worth of secondary storage, and millions of dollars in savings, for a major enterprise.

However, this portion of the Ebstyne patent states that the system "always leaves 15% of a PC's disk space free", but it does not clearly explain to one of ordinary skill in the art what "free" means, and the rest of the Ebstyne patent does not explain what "free" means. Therefore, one of ordinary skill in the art is left to speculate as to what "free" is intended to mean. It is submitted that one of ordinary skill in the art may believe that "free" disk space means disk space that is "empty" of any data. But this is not what claim 3 requires, as it requires that "said reserved portion of the disk drives [is] reserved for local use on the respective grid computer". If the "15% of a PC's disk space is" empty, then it is not "reserved for local use on the respective grid computer" as recited in claim 3. Further, new claim 23 requires that "reserving a portion of predetermined size of the total disk storage space includes restricting the portion of predetermined size of the total disk storage space from being included in the single combined virtual storage drive".

Claim 4 requires "determining the total disk storage space on each of the at least two grid computers and allocating the total disk storage space between a portion made available for use as part of the virtual storage drive and *a portion reserved for local use on the grid compute*" and "wherein the portion available for use as *part of the virtual storage space is of a fixed size* and the portion *reserved for local use on the grid computer is of a fixed size*".

The rejection of claim 4 points again to paragraph [0031] of Ebstyne, which has been quoted above, but as noted above this portion of Ebstyne does not disclose whether the 15% "free space" is actually used for storage by the local system, Ebstyne does not disclose that the 15% is actually a

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reserved portion of the disk space that cannot be used by either the local or the Ebstyne system. Indeed, it is submitted that one of ordinary skill in the art would believe that the 15% figure is employed as an illustration employed for statistical purposes to estimate the potential space that might be available. But since paragraph [0031] does not indicate that the 15% is actually reserved for local use, or that 85% is reserved for use by the Ebstyne system. Therefore, it is submitted that one of ordinary skill in the art would not arrive at the requirements of claim 4 from the Ebstyne patent application.

Claim 7 requires "allocating disk storage space on the at least one grid computer *after detecting activity indicating that additional storage space has been added* to the at least one grid computer" (emphasis added).

The rejection of claim 7 points again to the Ebstyne patent application at paragraph [0047] as allegedly disclosing this requirement, and there it states (all emphasis added):

[0047] The client tier 46 exists in all of the plurality of enterprise personal computers 32 that are going to be used to recapture the unused disk space and brokers unused disk space by intelligently managing blocks of data sent to and from the service tier 42. The client tier 46 serves several functions, such as reserving a configurable portion of available storage space and reacting dynamically to the changing local environment. As local disk-space is used by local applications, the client tier 46 will relinquish the reserved storage space. As local storage space becomes free, the client tier 46 gradually assumes more of the storage space. For example, if the service tier 42 needs to write a certain amount of data, the client tier 46 determines the best one of the plurality of enterprise personal computers 32 for this particular amount of data to be stored based on its usage requirements.

However, again, since Ebstyne does not detect the addition of storage space to the computer, it does not allocate storage space after detecting the addition of storage space.

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Claim 8 requires, in part, "receiving on one of the at least one grid computers, *from a local user of the one grid computer*, designation of a predetermined minimum amount of disk storage space on the disk drive of the one grid computer to be reserved from inclusion in the single combined virtual storage drive" and "monitoring the one grid computer for activity indicating that the predetermined minimum amount of reserved disk storage space of the total disk storage space on the one grid computer has not been maintained" (emphasis added).

It is conceded in the rejection of claim 8 that the Ebstyne patent application does not disclose all of the requirements of claim 8 as previously presented, and it is then asserted that:

However, Ebstyne failed to teach the further limitations of (i) monitoring at least one of the grid computers for activity indicating that a predetermined minimum amount of free disk storage space of the total disk storage space on the grid computer has not been maintained; wherein the predetermined minimum amount of free disk storage space is set using an agent application on the at least one grid computer; and (ii) allocating disk storage space on the at least one grid computer for use by local applications after detecting activity indicating that the minimum amount of free disk storage space has not been maintained to restore at least the minimum amount of free disk storage space.

The rejection then looks to the Ebata patent for the requirement that is conceded not to be found in the Ebstyne patent application:

Ebata, on the other hand, teaches a method for moving files between storages across the network to rebalance the free disk space across the network.

Ebata, on the other hand, teaches the method includes the step of monitoring at least one of the grid computers (i.e. at least one of the storage across the network) for activity indicating that a predetermined minimum amount (i.e. the threshold value) of free disk storage space of the total disk storage space on the grid computer has not been maintained (i.e. there is imbalance in available and minimum free disk space), wherein the predetermined minimum amount of free disk storage space is set using an agent application (i.e. an instruction from an administrator) on the at least one grid computer (i.e. the threshold value is set in the configuration information module (i.e. 180 in Fig. 1) of at least one grid computer (i.e. 8 in Fig. 1) (e.g. see paragraph [0045]); and (ii) allocating disk storage space on the at

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least one grid computer for use by local applications after detecting activity indicating that the minimum amount of free disk storage space has not been maintained to restore at least the minimum amount of free disk storage space (e.g. see the abstract). Accordingly, it would have been obvious to one ordinary skilled in the art at the time of the current invention was made to implement the steps taught by Ebata in the method taught by Ebstyne. In doing so, (i) a steady imbalance of the free disk spaces among the network storages is prevented so that clients can always use the system and even if client writes large files and a maximum quantity of data can be written to disks managed by the virtualized network

However, considering the requirements now further defined in claim 8, which are discussed, for example, on pages 11 and 12 of the present patent application, it is submitted that one of ordinary skill in the art, considering the discussions in either Ebstyne or Ebata, would not arrive at the requirements of claim 8, especially those requirements regarding the local user. Further, new claim 25 requires "receiving on the one grid computer, from the local user of the one grid computer, designation of a minimum amount of free disk storage space to be maintained on the disk drive of the one grid computer", which is also submitted to be foreign to Ebata

Claim 13 has been amended to include the requirements of claims 14 and 15 as previously considered, and claim 13 thus requires "allocating a portion of the total disk storage space on each of the at least two grid computers to be made available as part of the virtual storage drive" and "*reserving a portion of predetermined size of the total disk storage space on each of the at least two grid computers, said reserved portion of the disk drives being reserved for local use on the respective grid computer of the at least two grid computers*". (Independent claim 21 includes a similar requirement.) As noted above, the Ebstyne patent application does not disclose to one of ordinary skill in the art reserving space for local use, but instead discusses a statistical analysis that assumes that 15% of the space on a disk would be "free", but this does not indicate to one of ordinary skill in the art that this space is reserved for any particular purpose, much less

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reserved for local use. Further, the Ebata patent appears to suggest that free space should be absorbed into the system rather than reserved for any local uses.

It is therefore submitted that the cited patents, and especially the allegedly obvious combination of Ebstynce, Ebata, Wells, Watkins, and Oh set forth in the rejection of the Office Action, would not lead one skilled in the art to the applicant's invention as required by claims 1 through 22, and therefore the claims are also submitted to be in condition for allowance.

Withdrawal of the §102(b) and §103(a) rejections of claims 1 through 22 is therefore respectfully requested.

CONCLUSION

In light of the foregoing amendments and remarks, early reconsideration and allowance of this application are most courteously solicited.

Respectfully submitted,

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